

## IN THE SPECIFICATION

Please replace the paragraph starting at line 1 of page 17 with the following:

"In order to solve for the optimum height of the mirror, and the distance between virtual centers of projection of adjacent cameras, the angle  $\beta$  between the camera center axis and the horizon can be calculated as follows:

$$\beta = 90 - (2\alpha + \chi)$$

where  $\alpha$  is the angle of the mirror face and the vertical, and  $\chi$  is the tilt of camera with respect to the vertical. The distance between the center of projection  $C$  and the bottom edge of the mirror,  $o$ , is calculated as:

$$CO = C_x / \cos(90 - (VFOV / 2 + \chi))$$

where  $C_x$  is the  $x$  coordinate of the center projection and  $VFOV$  is the vertical field of view. This yields the  $y$  coordinate of the center of projection,  $C_y$ , as:

$$C_y = \sqrt{CO^2 - C_x^2}$$

The angles  $COP$  and  $CAO$  can be calculated as

$$COP = 180 - (\alpha + VFOV / 2 + \chi)$$

$$CAO = 180 - (VFOV + COP)$$

The distance between the top and bottom of the mirrors is:

$$AO = CO * \sin(VFOV) / \sin(CAO)$$

which yields the height of the mirror system,  $H$ , is:

$$H = \cos(\alpha) * AO.$$

A series of calculations yield the coordinates of the intersection of camera center axis and mirror

$P_x$ ,  $P_y$

$$CPO = 180 - (COP + VFOV / 2)$$

$$PO = CO * \sin(VFOV / 2) / \sin(CPO)$$

$$P_x = PO * \sin(\alpha)$$

$$P_y = PO * \cos(\alpha)$$

Once  $P_x$ ,  $P_y$ , are found it is possible to find the  $x$ , and  $y$  coordinates of the virtual center of projection,  $C'_x$ ,  $C'_y$  of a given camera as,

$$PC = PO * \sin(COP) / \sin(VFOV / 2)$$

$$PC' = PC$$

$$C_x = PC^* \cos(\beta) - P_x$$

$$C_y = P_y - PC^* \sin(\beta)$$

where  $PC$  is the distance between the point of intersection of the camera center axis and the mirror and the center of projection of the camera.

Performing these calculations for a set of adjacent cameras, yields the distance between the virtual centers of projection,  $C_{dist}$ , for the set as,

$$M_x = B$$

$$C_x M_x = |C_x - M_x|$$

$$C_{dist} = 2 * C_x M_x * \sin(36)$$

where  $M_x$  is the  $x$  coordinate of the intersection of the bottom plane of the mirror and the axis of symmetry and  $B$  is the horizontal distance between the bottom edge of the mirror and the intersection of the bottom plane of the mirror and the axis of symmetry.

Other parameters that are useful in designing a specific embodiment of the camera system include, the radius of the top,  $B2$ , which can be defined as:

$$B2 = B + H / \tan(\alpha);$$

and the lengths of the bottom and top mirror edges,  $E1$ ,  $E2$ , which are given by:

$$E1 = 2 * \tan(36) * B$$

$$E2 = 2 * \tan(36) * B2.$$

The projected image length on the bottom and top mirror edges can be calculated as:

$$PE1 = CO * \sin(HFOV / 2) * 2$$

$$PE2 = AC * \sin(HFOV / 2) * 2 ."$$